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Coralline algal rhodoliths form extensive benthic communities in the Gulf of Chiriqui, Pacific Panama



Fig. 1 The research team collecting from an extensive rhodolith bed at 30 m



Fig. 2 An array of diverse coralline algal species typical of 10–30 m sedimentary habitats throughout the Gulf of Chiriqui



Fig. 3 Fleshy algal epiphytes attached to coralline algal nodules (rhodoliths)

Large areas of rhodolith beds (free-living, crustose, calcareous, Rhodophyta nodules) have been documented worldwide (Foster 2001), but are not well-known for Pacific Panama. We observed vast maërl expanses of calcareous red algal rhodoliths (Fig. 1) covering sedimentary bottoms between island groups throughout the Gulf of Chiriqui, during our September 2007 expedition. These predominant coralline algal communities (Fig. 2), mostly between 10–30 m deep, consisted of numerous crustose coralline algal species (e.g., *Lithophyllum divaricatum*, *Lithophyllum alternans*, *Lithothamnion indicum*, *Lithothamnion australe*, *Fosliella fertilis*) and serve as microhabitats and primary substrates for a high diversity of relatively small animals and fleshy red algae (Fig. 3; e.g., *Hypnea* spp., *Gelidium* spp., *Halymenia* spp., *Sebdenia* spp., *Peyssonnelia* spp.). Hypothetically, the instability/mobility of the fist-size rhodolith spheres precludes the development of highly structured macroalgal or macrofaunal communities. On the other hand, we posit that rhodoliths provide a two-dimensional hard-substrate refuge for smaller algae from the intense herbivory (limpets, chitons, sea urchins, and fishes) characteristic of Pacific Panama (reviewed by Birkeland 1988) and present throughout the heterogeneously structured coral reefs and broad (7 m tidal amplitude) rocky intertidal zones of the islands and outcrops we studied.

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References

- Birkeland C (1988) Geographic comparisons of coral-reef community processes. Proc 6th Int Coral Reef Symp 1:211–220
Foster MS (2001) Rhodoliths: between rocks and soft places. J Phyc 37:659–667

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